Material Safety Data Sheet

Section 1: Chemical Product / Company Identification

<table>
<thead>
<tr>
<th>Trade name</th>
<th>HFC-134a</th>
</tr>
</thead>
</table>

Company identification
Manufacturer: DAIKIN INDUSTRIES, LTD. CHEMICAL DIVISION:
Umeda Center Bldg., 4-12, Nakazaki-Nishi2-chome, Kita-Ku, Osaka, JAPAN
Phone: (+81)6-6373-4349 Fax: (+81)6-6373-4389

Supplier in EU: DAIKIN CHEMICAL EUROPE GmbH
ImmermannStr.65 d,40210 Düsseldorf, GERMANY
Phone: (+49) 211-1640-834. Fax: (+49) 211-1640-734,

Supplier in US: DAIKIN AMERICA, INC.
20 Olympic Drive, Orangeburg, New York 10962
Phone: +1-800-365-9570

Emergency telephone
Company +81-6-6373-4349, +49-211-179 225 0, +1-845-365-9500

Section 2: Composition / information on ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>mass %</th>
<th>CAS No.</th>
<th>Symbols</th>
<th>R-Phrase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1,1,2-Tetrafluoroethane</td>
<td>&gt;99.6</td>
<td>811-97-2</td>
<td>n.ap</td>
<td>n.ap</td>
</tr>
</tbody>
</table>

Section 3: Hazard identification

Potential Health Effects:
Non-flammable liquefied gas.
This product may cause asphyxiation if released in a confined area.

WARNING: Toxic gases (such as HF, CO) will be produced if this product is decomposed by heat.
The result of the combustion test indicates this product may be flammable under the condition as follows: above 5kg/cm², at 170°C, 8-12vol% in air.

Section 4: First aid measures

Inhalation
Remove to fresh air. Keep warm and at rest.
If breathing has stopped, give artificial respiration.
Use oxygen as required, provided a qualified operator is available.

Skin Contact
Wash with lukewarm water (not hot).
Consult a physician if frostbitten by liquid or if irritation occurs.

Eyes Contact
Flush with plenty of water for several minutes (remove contact lenses if easily possible). Consult a physician.

Ingestion
Ingestion is not considered a potential route of exposure.

Section 5: Fire-fighting measures

Extinguishing Media

Fire-fighting procedures:
Keep personnel removed and upwind of fire.
Wear self-contained breathing apparatus (SCBA) and full protective equipment.
Water may be used to cool and protect exposed containers.
Stop the flow of gas if possible.

WARNING: Hazardous decomposition products including carbon dioxide, carbon monoxide, hydrogen fluoride, toxic gases or particles may be formed during combustion. These products may cause severe eye, nose, throat, and lung irritation or toxic effects.
**SECTION 6: Accidental release measures**

**General Information**
Use proper personal protective equipment as indicated in Section 8. Keep personnel not involved with emergency activities removed and upwind.

**Spills/Leaks**
Protected personnel should shut off leak, if without risk, and provide ventilation. Do NOT let this chemical enter the environment.

**SECTION 7: Handling and storage**

**Handling**
Use proper personal protective equipment as indicated in Section 8. Use in well ventilated areas. Wash hands thoroughly after handling. Wash clothing after use. Exposure to toxic gases through inhalation can occur if smoking tobacco becomes contaminated by this material. Therefore, do not smoke in the work areas and wash hands and face after handling in order to avoid transfer of the material onto smoking tobacco. Keep away from heat, sparks and flames.

**Storage**
Keep containers tightly closed in a cool place away from heat, sparks, and flames. Store in a tightly closed container.

**SECTION 8: Exposure controls / personal protection**

**Exposure Guidelines:**
- **Exposure limits**
  - AIHA WEEL-TWA: 1000ppm
  - (AIHA: American Industrial Hygiene Association)

**Engineering Controls:**
Provide local exhaust to prevent accumulation of high concentrations.

**Personal Protective Equipment:**
- **Eyes**
  - Wear safety glasses or coverall chemical splash goggles.
- **Clothing**
  - Wear impervious gloves, apron, pants, and jacket.
- **Respirators**
  - Wear NIOSH approved respiratory protection, as appropriate.

**SECTION 9: Physical and chemical properties**

**Appearance**
Colorless liquified gas

**Odor**
Characteristic odor

**PH**
Not applicable

**Boiling point/ range**
-26.18 °C

**Triple point**
-101 °C

**Flash point**
None

**Flammable Limits**
None

**Vapor pressure**
0.666 Mpa (6.79 kgf/cm² abs) at 25 °C

**Relative vapour density**
3.52 (air = 1)

**Solubility**
- water solubility
0.15/100g H₂O at 25 °C

**SECTION 10: Stability and reactivity**

**Reactivity**
Stable at room temperature in closed containers under normal storage and handling conditions.

**Conditions to avoid**
Ignition sources, excess heat.

**Incompatibilities**
Avoid contact with strong alkali or alkaline earth metals, finely powdered metals such as aluminum, magnesium or zinc and strong oxidizers, since they may react or accelerate decomposition.

**Polymerization**
Polymerization will not occur.

**THERMAL DECOMPOSITION PRODUCTS:**
Hazardous decomposition products including carbon dioxide, carbon monoxide, hydrogen fluoride, toxic gases or particles may be formed during combustion. These products may cause severe eye, nose, throat, and lung irritation or toxic effects.
**SECTION 11: Toxicological information**

| Acute toxicity | Inhalation rat 4-hour LC50 >500,000ppm |
| Chronic toxicity | Inhalation rat NOEL=10,000ppm/2years |
| Ames assay | Negative |
| Teratogenicity | Inhalation rabbit: negative (40,000ppm) |

**SECTION 12: Ecological information**

- Does not deplete ozone.
- Potential (GWP) of 1300 (relative to a value of 1 for carbon dioxide at 100 years).

G.W.P : Global warming potential

**SECTION 13: Disposal considerations**

- Best to recover and recycle.
- If this is not possible, destruction is to be in an approved facility which is equipped to absorb and neutralise acid gases and other toxic processing products.
- Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations.

**SECTION 14: Transport information**

- UN No.: 3159
- ICAO/IATA -primary: 2.2
- IMDG -primary: 2.2
- Proper Shipping Name: 1,1,1,2-TETRAFLUOROETHANE

**SECTION 15: Regulatory information**

- NFPA-HMIS RATINGS (SCALE 0-4): HEALTH=1, FIRE=0, REACTIVITY=1
- EC Classification: EXTREMELY FLAMMABLE
- Hazard Symbol: -
- Risk Phrases: -
- Safety Phrases: -

**SECTION 16: Other information**

- TSCA Chemical Inventory: Listed
- Korea Inventory: Listed
- Philippine Inventory: PICCS: Listed
- Japan: Listed
- EINECS Number: Listed

This product is not designed, manufactured, or intended for medical uses, including implantation to the body or other applications in direct contact with body fluids or tissues. Do not use for non-industrial applications.

The information in this Material Safety Data Sheet (MSDS) is believed to be correct as of the date issued. The information does not relate to use in combination with any other material or in any process.

DAIKIN INDUSTRIES, LTD.CHEMICAL DIVISION:
homepage: http://www.daikin.co.jp/chm/intro/index.html